Subject: Re: Algorithm for PCA transform in ENVI
Posted by ivitseva on Thu, 10 May 2012 14:39:45 GMT
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On May 10, 2:12 pm, alx <lecacheux.al...@wanadoo.fr> wrote:
> On 10 mai, 11:17, ivitseva <eva.ivits-was...@jrc.ec.europa.eu> wrote:
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>
>> On May 9, 5:01 pm, "Kenneth P. Bowman" <k-bow...@null.edu> wrote:
>
>>> In article < 0de35e20-3a9c-4593-8f06-ed3e6461f...@p21g2000vby.googlegroup s.com >,
>
>>> eva.ivits-was...@ext.jrc.ec.europa.eu wrote:
>>>> Does anybody know what the algorithm for PCA transform in ENVI is?
>>>> I've compared the eigenvectors and the spatial patterns of ENVI's PCA
>>>> transform with IDL's eigenql, svdc and la_svd procedures. The first PC
>>>> components are the same but from the second component on I have
>>>> negative values where ENVI give positive values and vice versa.
>>>> Accordingly, the first element in the diagonal of the eigenvector
>>>> matrices has the same sign but the rest of the signs are just the
>>>> oppostie comparing results from ENVI and IDL.
>>>> Any clues?
>>>> Thanks in advance,
>>>> Eva
>
>>> If you have a properly-constructed covariance matrix, the eigenvalues should all
>>> be greater than or equal to zero. If you are getting negative eigenvalues you
>>> are doing something wrong.
>
>>> http://brunnur.vedur.is/pub/halldor/PICKUP/eof.pdf
>
>>> Ken Bowman
>
>> Hi Ken,
>> Thanks.
>> It is the eigenvectors and not the eigenvalues I was talking about
>> (btw. the eigenvalues are all positive). And using the svdc function
>> you do not use the covariance matrix but the centered time series.
>> Anyway, the problem is that the signs in the spatial patterns (EOFs or
>> the modes) are the opposite of that what ENVI reports, which is
>> probably a question of rotation. However, I do not know what ENVI does
>> and thus I cannot decide what the problem is. That is why I've posted
>> the question.
>
>> Eva

>
> Eva,
> SVD algorithm produces unique singular vectors, up to multiplication
> by an unit phase factor (for the real case up to sign). That is the
> same as saying that singular vector matrices must be unitary.
> ENVI and IDL are not in contradiction. They are just doing different
> arbitrary choices.
> alain.

Hi Alain,

I understand when you are saying that ENVI and IDL are just doing different arbitrary choices. However, if I look at the second EOF mode I will have negative values in ENVI reporting, using precipitation anomalies as input, drought whereas I'll have positive values in IDL's output reporting wetter than average conditions. Over the same pixels! I still do not understand how the outcomes can be so different, I mean COMPLETELY different up to the level of reporting a contradictory meteorological phenomena! Sorry for being difficult....
Cheers,
Eva
